195* Bronchoalveolar lavage (BAL) findings in symptomatic preschool children with and without CF

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Neutrophilic lung infection and inflammation are typical for CF but have also been reported in preschool children with recurrent wheeze. We therefore compared BAL results in 143 symptomatic preschool (<5 y) children: CF and persistent lung infection (n = 19), recurrent lung infection without wheeze (LI) (n = 77), recurrent lung infection with persistent wheeze (WH) (n = 47). Medians and IQR are reported; for group comparison Kruskal–Wallis was used.

Results: Total cell count ($\times 10^3$/ml) was higher ($P < 0.001$) in CF 1323 (430–2200) than LI 176 (100–311) and WH 207 (120–437); % neutrophils was also higher ($p < 0.001$) in CF 87% (72–92) than in RI 16% (4–38) and WH 23% (8–56). % eosinophils was <1 in all groups and did not differ between LI and WH. % macrophages was lower in CF 9 (5–20) than in RI 64 (42–84) and WH 56 (29–78) but lipid laden macrophage index was higher ($p = 0.007$) in CF 132 (100–175) than RI 68 (44–105) and WH 68 (50–98). BAL cultures were +ve for *S. aureus* in 42% of CF ($p < 0.01$) compared to 4% of RI and 8% of WH. *H. influenzae* was present in 16% of CF, 21% of RI, and 11% of WH. *S. pneumoniae* was present in 0% of CF, 13% of LI, 4% of WH. *P. aeruginosa* was not isolated.

Conclusion: Symptomatic preschool children with CF have higher BAL total cell counts due to marked increase in neutrophils compared to children with LI and WH. In CF cultures are more often positive with *S. aureus* prevailing. Eosinophilia is not detected in BAL, not even in group WH. Absolute macrofage count is similar in all groups but lipid laden macrophage index in higher in CF children suggesting that recurrent aspiration may be associated with their persistent symptoms.

196* Microbiological yield of induced sputum vs throat swab in CF patients unable to produce spontaneous sputum

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We obtained an induced sputum sample (i.s.) in 175 (90%) times out of 193 inductions in 50 CF patients aged 11.7 (5–18) unable to produce spontaneous sputum (s.s.).

Protocol:

1. throat swab (t.s.) after voluntary cough,
2. Spirometry and β2-agonist inhalation,
3. Sputum induction by nebulising 3% saline with a DeVilbiss Ultraneb,
4. Spirometry.

The quality of i.s. samples was assessed following the Murray criteria and compared with that of s.s. in our CF patients.

Results: Pathogenic bacteria grew in 79 (45%) i.s. vs 43 (25%) t.s. ($p < 0.01$). Fungal cultures were (+) in 46 (26%) i.s. vs 3 (2%) t.s. ($p < 0.001$). There was bacteriological concordance in 107 (61%). *Staphylococcus aureus* (S.a.) grew in 48 (28%) i.s. vs 27 (15%) t.s. ($p < 0.05$). *Stenotrophomonas maltophilia* (S.m.) in 18 i.s. vs 8 t.s. ($p < 0.05$). *Pseudomonas aeruginosa* grew in 21 i.s vs 12 t.s. (n.s.). In 15 it grew in i.s. only vs 6 in t.s. only. There were >25 PMNs/field in 48 (28.5%) i.s. vs 170 (77%) s.s. ($p < 0.001$), and >10 epithelial cells/field (upper airway contamination marker) in 89 (52%) i.s. vs 132 (60%) s.s. (ns). No patient developed clinically significant bronchoconstriction.

Conclusions: Sputum induction is a simple, feasible, well tolerated technique which can be successful in most CF patients older than 5 unable to produce a s.s. Its sensitivity for the recovery of any bacteria, fungi, S.a., and S.m. is higher than that of t.s. The frequency of contamination with upper airways secretions was similar in i.s. and s.s. The greater number of s.s. with >25 PMNs/field is probably due to the presence of higher lower airways inflammation in CF patients able to produce s.s. Sputum induction should be used more frequently in CF. Further research is warranted.

197* Detection of viruses in pulmonary exacerbations in CF

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Aims: To evaluate the involvement of viruses in CF pulmonary exacerbations and to identify the main viral pathogens.

Methods: Respiratory viruses were searched for, at the onset of any acute pulmonary exacerbation, in respiratory secretions obtained by nasal wash or bronchoalveolar lavage (BAL) using multiplex-PCR and culture, and potentially blood for viral serology.

Results: For 199 acute pulmonary exacerbations in 86 CF-patients (median age = 11 y 4 m, sex ratio: F/M = 42/44), a viral pathogen was detected in 64/199 (32.2%) episodes and in 3/64 episodes 2 viruses were found. The 3 main viral pathogens were influenza A virus, respiratory syncitial virus and human metapneumovirus, respectively found in 15, 15 and 8 episodes. In 56/64 (87.5%) episodes the viral pathogen was detected on respiratory secretions (nasal wash: 52×, BAL: 4×) and only in 9/30 (30%) by serology. Common viruses were found in all ages, however influenza A was mostly detected in adults (in 11/24 = 45.8%) whereas RSV was more present in the 0–2 yrs old (in 7/14 = 50%).

Conclusions: Common respiratory viruses seem to play a role in an unexpected high proportion (32%) of pulmonary exacerbations in CF-patients of all age groups. PCR and culture on respiratory secretions obtained by nasal wash is a rapid, sensitive and non-invasive method for viral detection compared to serology.

198 Clinical features of Swine Flu in a major adult CF unit in London

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Introduction: In the Swine Flu (SF) pandemic, UK guidelines advised that patients sought antiviral treatment after telephone discussion. In July 2009, we set up a Triage Service for an adult unit serving approximately 600 patients to provide advice and monitoring beyond antiviral therapy alone.

Methods: An information letter was distributed to all patients that included UK screening criteria for suspected SF (fever, cough, myalgia, vomiting/nausea, headache, rhinorrhoea) and a dedicated phone number. Risk stratification, based on baseline FEV1, resting O_2 saturations and exacerbation frequency, was used to advise either home treatment with antibiotics and antivirals, or hospital review.

Results: During the period 3rd July 2009 – 16th January 2010, 165 calls were received: 98 for advice and 67 with symptoms. 29/67 (43%) calls and a further 2 direct referrals resulted in hospital review with the following outcomes: 20 (65%) admissions; 21 (68%) given antivirals (20 Oseltamivir, 1 Zanamivir); 28 (90%) given antibiotics (19 intravenous); SF-confirmation via antigen/antibody testing or PCR in 11 cases. Cases of confirmed vs non-confirmed SF showed increased fever (82% vs 41%), headache (73% vs 20%), raised CRP (94 mg/l vs 52 mg/l), lower neutrophil counts (5.5 vs 9.4×10^9/ml) and increased length of stay (10d vs 4d). Sputum showed patients' usual microbiology. There were no ITU admissions or deaths.

Conclusions: Our Triage Service was able to effectively risk-stratify patients, admitting those at highest risk for comprehensive in-patient care including intravenous therapy. SF was a mild illness for the majority, with fever and headache most discriminatory in those who attended.